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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,978	03/21/2005	Jorg Habetha	DE02 0084 US	2916

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PHILIPS ELECTRONICS NORTH AMERICA CORPORATION
INTELLECTUAL PROPERTY & STANDARDS
370 W. TRIMBLE ROAD MS 91/MG
SAN JOSE, CA 95131

EXAMINER

RUTKOWSKI, JEFFREY M

ART UNIT	PAPER NUMBER
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2619

MAIL DATE	DELIVERY MODE
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12/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/509,978

Applicant(s)

HABETHA, JORG

Examiner

Jeffrey M. Rutkowski

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/01/2004, 03/21/2005.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1-10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. For **claims 1-5 and 10**, the use of the term "other logic" in **claim 1** renders the claim indefinite because there is no recitation as to what is considered to be "other logic". The claims also do not provide antecedent basis for "...the input variables..." [**claim 1**] since there is no previous recitation of input variables.

4. For **claims 6-9** the limitations for "a device" renders the claim indefinite since it is not clear as to whether or not each recitation of "a device" is referring to the same device or a different device. The claims should identify the parts that are performing the configured actions.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-4 and 6-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Balakrishnan et al. (US Pat 7,035,240), hereinafter referred to as Balakrishnan in view of Arnold

Art Unit: 2619

et al. (US Pat 5,822,301), hereinafter referred to as Arnold, and the Specification, hereinafter referred to as the admission.

7. For **claims 1-4**, Balakrishnan teaches a method for low-energy adaptive clustering hierarchy **[title]**. Nodes in a network are provisioned according to a Low-Energy Adaptive Clustering Hierarchy (LEACH) protocol (system of rules defining the arrangement of the stations) **[col. 6 lines 43-55]**. Nodes organize themselves into local clusters **112a-c [figure 1B]**. Nodes in the local clusters are classified as either a cluster-head or a non-cluster-head (one or more classification categories) **[col. 5 lines 60-65]**. The clusters formed according to the LEACH protocol are adaptive. According to the LEACH protocol, each non-cluster-head node measures the signal strength of cluster-head status announcement messages transmitted by the cluster-head nodes. The non-cluster-head node compares the signal strength and selects the cluster-head that requires the minimum communication energy (cluster change of a station) **[col. 11 line 64 to col. 12 line 3]**. Step 630 of figure 6 shows the cluster-head node is able to determine topology changes via receiving data from cluster members **[col. 14 lines 60-67]**. The information sent from the cluster members can be aggregated by the cluster-heads to be used in a beam forming application **[col. 15 lines 35-40, 50-55]**.

8. Balakrishnan does not teach the use of fuzzy logic input variables. Arnold teaches the fuzzy logic input variables limitation absent from the teachings of Balakrishnan by disclosing the use of linguistic variables in a fuzzy system that determines the weight of a connection **[col. 7 lines 25-28, col. 8 line 30 and col. 9 line 40]**. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use fuzzy logic variables in Balakrishnan's invention to increase the speeds at which cluster membership decisions are made.

Art Unit: 2619

9. Balakrishnan does not teach the generation of an output variable or a decision variable.

Arnold teaches the output variable generation limitation absent from the teachings of Balakrishnan by disclosing rule bases are used to evaluate the linguistic variables (fuzzy coded) [col. 9 line 40]. The rule bases are used to form intermediate variables or connection weighting (decision variable) [col. 9 lines 45-48]. The connection weighting is then used to select the connection with the shortest path (permitted network topology change to be made) [abstract]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use a set of rules to generate an output variable in Balakrishnan's invention to be able to analyze linguistic variables. It also would have been obvious to a person of ordinary skill in the art at the time of the invention to use an output decision variable in Balakrishnan's invention since more than one metric is usually taken into account when choosing the best path.

10. As previously discussed, Balakrishnan discloses the cluster change of a station is a permitted topological change. Additionally, clusters in Balakrishnan's invention are formed every round of operation (creation of new clusters) [col. 9 lines 30-40]. Balakrishnan does not teach pre-defined fuzzy permitted topology changes. The admission teaches the deletion and shifting of clusters limitation absent from the teachings of Balakrishnan by disclosing a prior art document by S. Mann that uses a fuzzy classification system to take into account dynamic cluster changes. Mann also takes into account the deletion and shifting of clusters [Specification, page 7 line 27 to page 8 line 5]. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use a fuzzy classification in Balakrishnan's invention to allow for more accurate beam forming by antennas in the network.

11. For **claims 6-7**, Balakarishnan teaches node hardware architecture that contains a microprocessor **128** (a device for classifying, determining, adapting) **[figure 2]**. Given that the cluster-head node aggregates all information sent from nodes in the cluster **[col. 14 lines60-67]**, the nodes obviously contain a memory device.

12. Balakarishnan does not teach a device for fuzzy logic variables or a rules table that evaluates fuzzy logic variables. Arnold teaches the fuzzy logic and rule table limitations absent from the teachings of Balakarishnan by disclosing a fuzzy evaluation system **[figure 2]**. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use a fuzzy evaluation system in Balakrishnan's invention to increase the speeds at which cluster membership decisions are made.

13. Balakrishnan teaches the cluster change of a node is a permitted topological change. Additionally, clusters in Balakrishnan's invention are formed every round of operation **[col. 9 lines 30-40]**. Balakrishnan does not teach the shifting of clusters or the deletion of clusters. The admission teaches the deletion and shifting of clusters limitation absent from the teachings of Balakrishnan by disclosing a prior art document by S. Mann that takes into account dynamic cluster changes including the deletion and shifting of clusters. It would have been obvious to a person of ordinary skill in the art at the time of the invention to take into account the deletion and shifting of clusters in Balakrishnan's invention since both cluster changes would have an effect on how beam forming activity.

14. For **claim 8**, Balakrishnan teaches each cluster contains a cluster head-node (central controller) **[figure 1B]** and cluster head-nodes are selected for a given round of communication **[figure 6]**.

15. For **claim 9**, Balakrishnan teaches the cluster head-nodes **110dch, 110c'ch, aa0hch** perform the functions of a forwarder **[figure 1B]**.

16. For **claim 10**, Balakrishnan's method uses conventional data analysis techniques **[abstract and figure 1B]**.

17. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan in view of Arnold and the admission as applied to **claim 1** above, and further in view of Sugeno et al. ("A Fuzzy-Logic-Based Approach to Qualitative Modeling"), hereinafter referred to as Sugeno.

18. For **claim 5**, the combination of Balakrishnan, Arnold and the admission disclose the use of linguistic variables **[col. 9 line 40]**. The combination of Balakrishnan, Arnold and the admission do not teach the use of Mamdani variables. Sugeno teaches the Mamdani variable limitation absent from the teachings of Balakrishnan, Arnold and the admission by disclosing Mamdani variables are used in linguistic control **[page 8, 3rd paragraph]**. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use Mamdani variables in Balakrishnan's invention since Mamadani control methods would allow only for path changes to be made only when a big benefit can be attained by making the change.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey M. Rutkowski whose telephone number is (571) 270-1215. The examiner can normally be reached on Monday - Friday 7:30-5:00 PM EST.

Art Unit: 2619

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeffrey M Rutkowski
Patent Examiner
12/13/2007

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